July 22, 2002

To: Bruce Baller and Nancy Grossman

From: Sam Childress

Subject: Comments on the Review of NuMI Beamline Radiation Safety – July 17,'02

Planning for NuMI Radiation Safety is well advanced, and based on a considerable amount of careful work. My review comments are as follows:

1) By far my greatest concern is with airborne activation and the release levels of radioactive isotopes. The projected release levels for NuMI of < 45 Ci / year are uncomfortably high compared to the Laboratory limit of 100 Ci / year.
    a. Combining with projected airborne activation for other target systems – PBAR (with projected higher intensities) BooNE, SY120 , etc. there seems very little, if any safety margin.
    b. Our calculations projecting 45 Ci/year are based on air movement rates significantly lower than what may be needed to prevent moisture related equipment problems.
    c. It can be very difficult to seal the piles better if problems are seen after they have been radiated.

    It would be very good to work toward improvements of projected air release from the piles as part of the system design – to accomplish a safety margin upfront.

2) On page 16 of Nancy's presentation, an alarm for "bad" vacuum (> 10^{-5} Torr) was listed for accident loss. Maintaining at least this level of vacuum is needed for **DC** conditions in the Carrier Tunnel region. Instrumentation requirements also dictate that we continuously provide a vacuum at this level.

3) I would discourage consideration of "previously radiated" lead bricks in the beam tunnels for NuMI hand stacked shielding. The disposition problems can only go up with the brick radiation levels.

    We have (as example, for KTeV) entombed mixed material shielding blocks as part of a system shielding. But here, this shielding was not subject to further activation, serving as an inner part of a counting room shield well away from the beam line.